# TeMix/OASIS Transactive Protocols

## and

## Possible Regulatory and Market Frameworks

September 25, 2015
California Public Utilities Commission
San Francisco, CA

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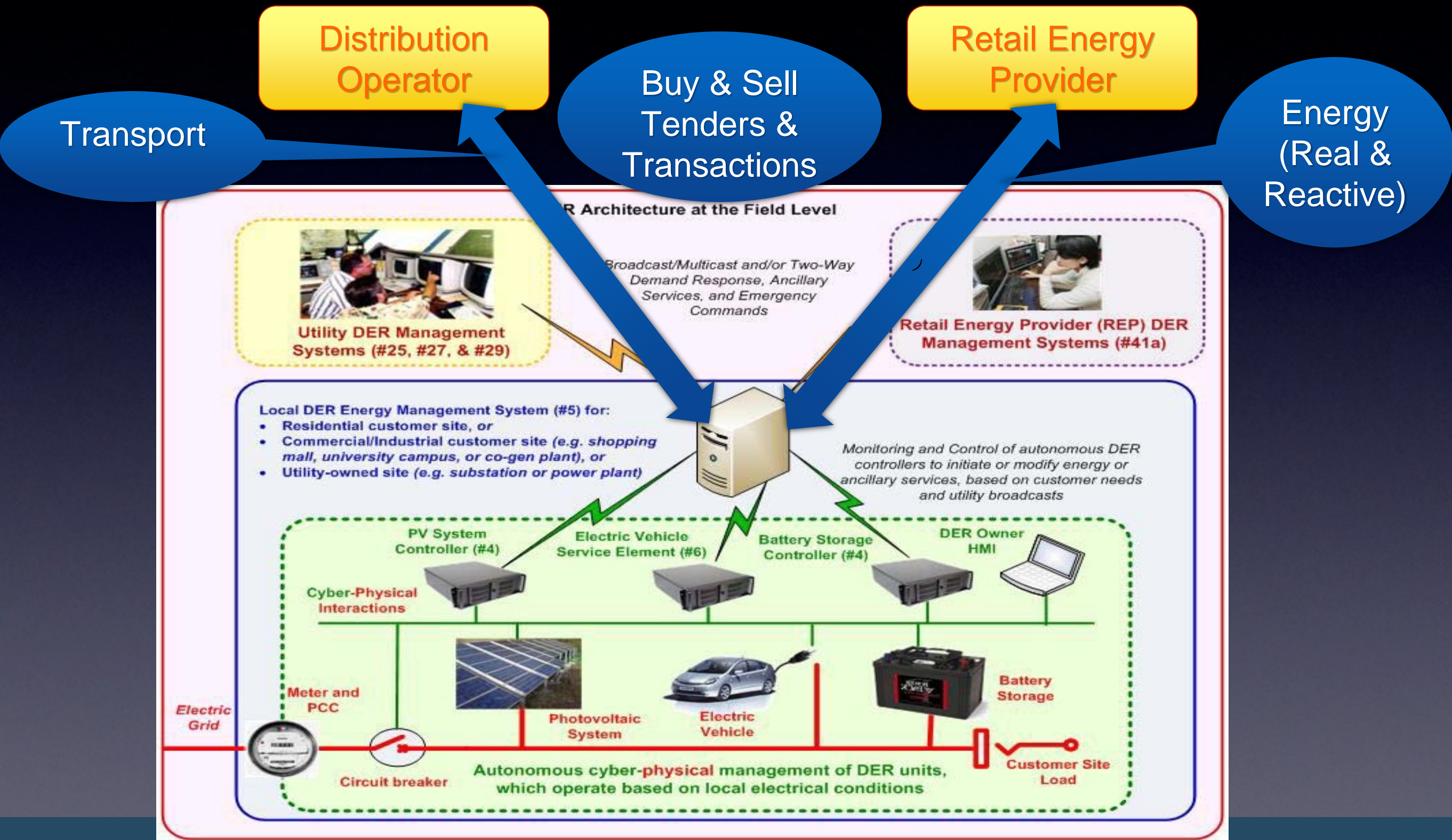# The four big ideas of Transactive Energy (TE):

Forward transactions are used to coordinate investments and manage risk.

Spot transactions are used to coordinate operating decisions.

All parties act autonomously.

There are two products: energy and transport..

# Transactive Energy Interfaces for DER

# TeMix/OASIS Information Model and API

www.oasis-open.org/committees/tc_home.php?wg_abbrev=energyinterop

Transactive State:

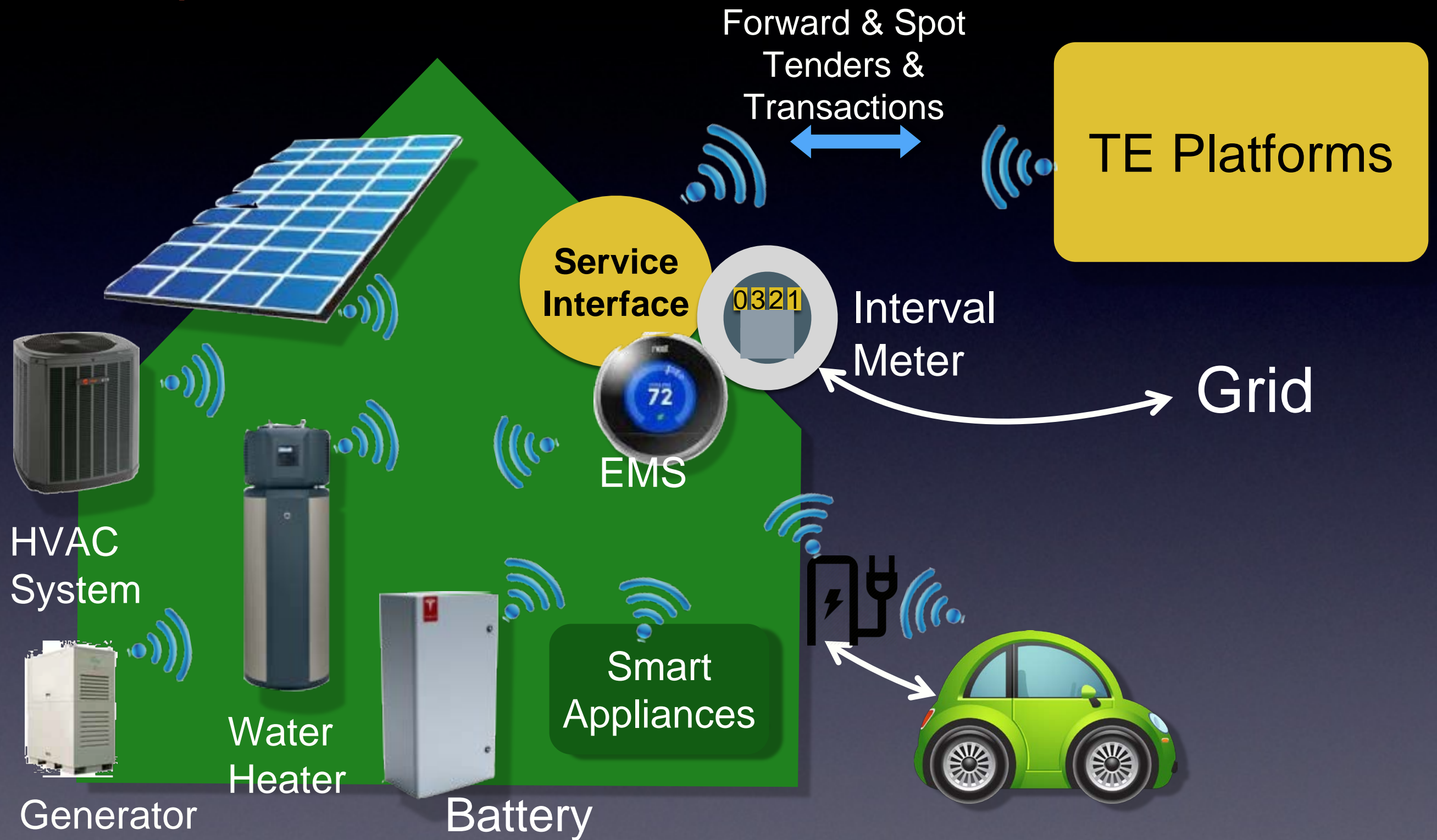| Tender | Transaction | Position | Delivery |
| --- | --- | --- | --- |

Product Type: Energy, Transport

Subscription Type: Fixed, Call, Put

WS-API: Create, Request

Attributes: Market, Agreement, Transactive State, Product Type, Subscription Type, Real/Reactive, Interface(location),

Start Time, Duration, Side, Quantity, Price, Expires(tender)

# People automatically manage facilities and devices in response to Tenders from TE Platforms.
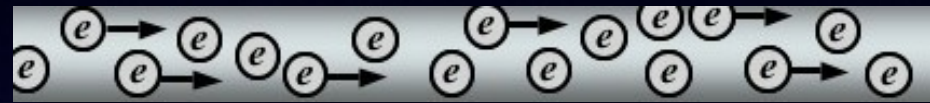


Forward & Spot Tenders & Transactions

TE Platforms

Service Interface

0321

Interval Meter

Grid

EMS

HVAC System

Generator

Water Heater

Battery

Smart Appliances

# A two-way Transport product delivers the Energy product.

Electric energy
(at a place and
time)

Transport

Electric energy
(at a different place
and same time)

Example:
Transmission
Connected
Substation

Example:
Two-way
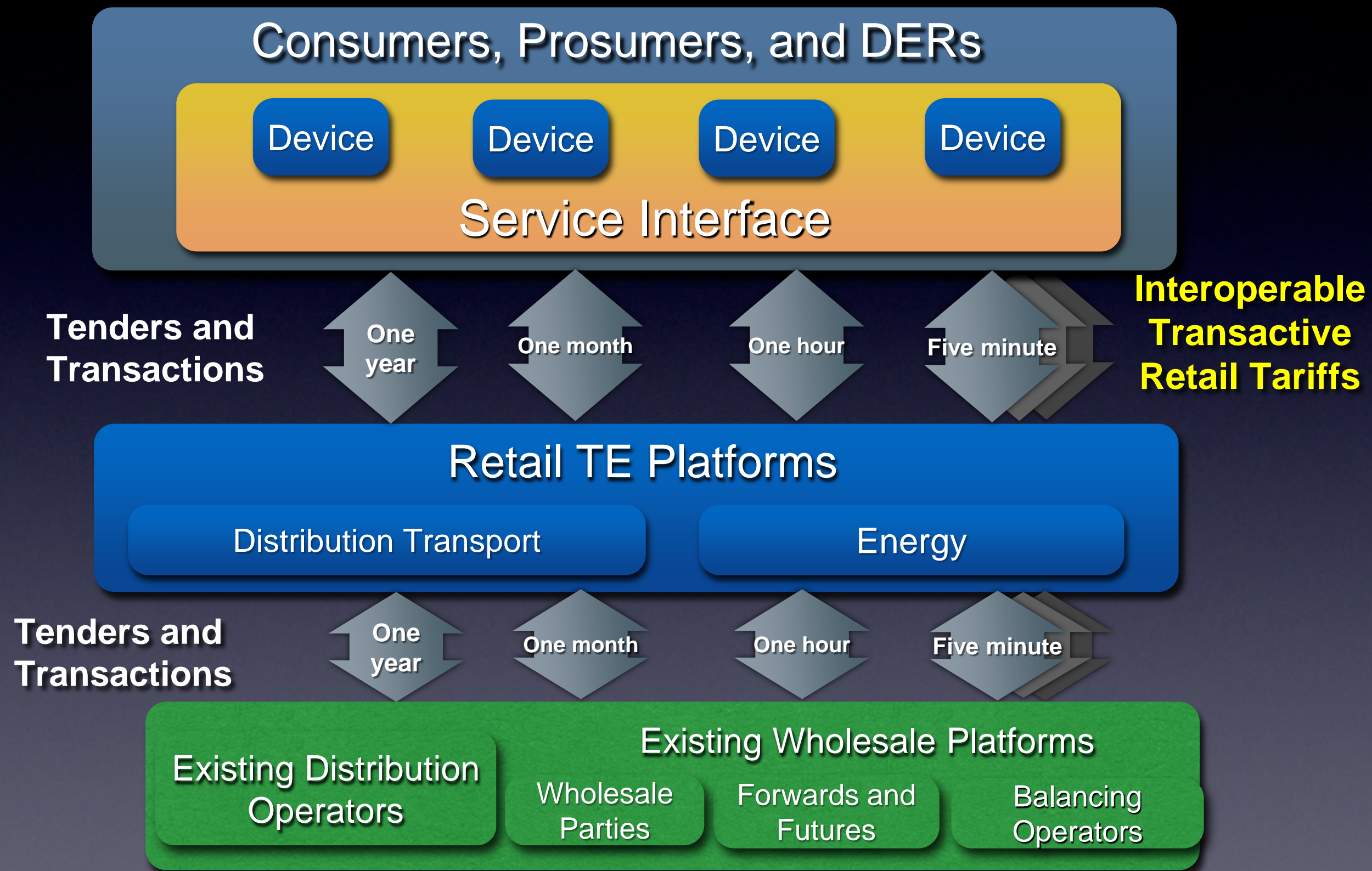Feeder

Example: Building

Transactive Tariff: Recover more of the cost-of-service when transport is heavily loaded in either direction

# Vision: The "grid of people" who manage the "grid of things"
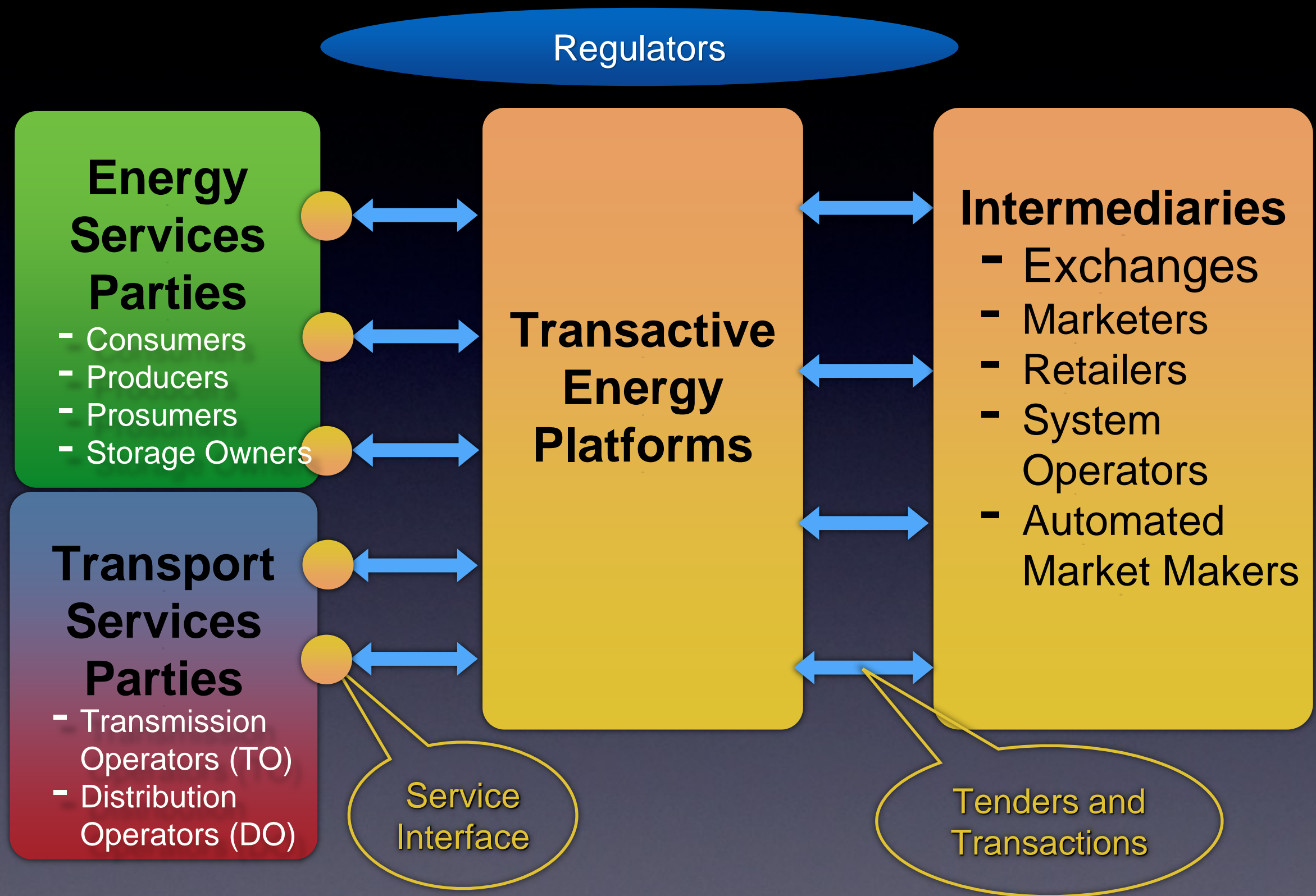
# Retail platforms and tariffs work with current wholesale platforms and distribution operators.

**Consumers, Prosumers, and DERs**

| Device | Device | Device | Device |

**Service Interface**

**Tenders and Transactions**

One year | One month | One hour | Five minute

**Interoperable Transactive Retail Tariffs**

**Retail TE Platforms**

Distribution Transport | Energy

**Tenders and Transactions**

One year | One month | One hour | Five minute

**Existing Wholesale Platforms**

Existing Distribution Operators

Wholesale Parties | Forwards and Futures | Balancing Operators

TEA™

TRANSACTIVE ENERGY ASSOCIATION

[www.tea-web.org](http://www.tea-web.org)

# Transactive Energy

## A Sustainable Business and Regulatory Model for Electricity

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